

Weekly Report

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Projects

PhD Thesis

- The overview figure is shown in Figure 1.
- The existing content of the SVM project and the transfer learning project have been migrated into the thesis template.
- The section of related work is reforming from my existing publication.

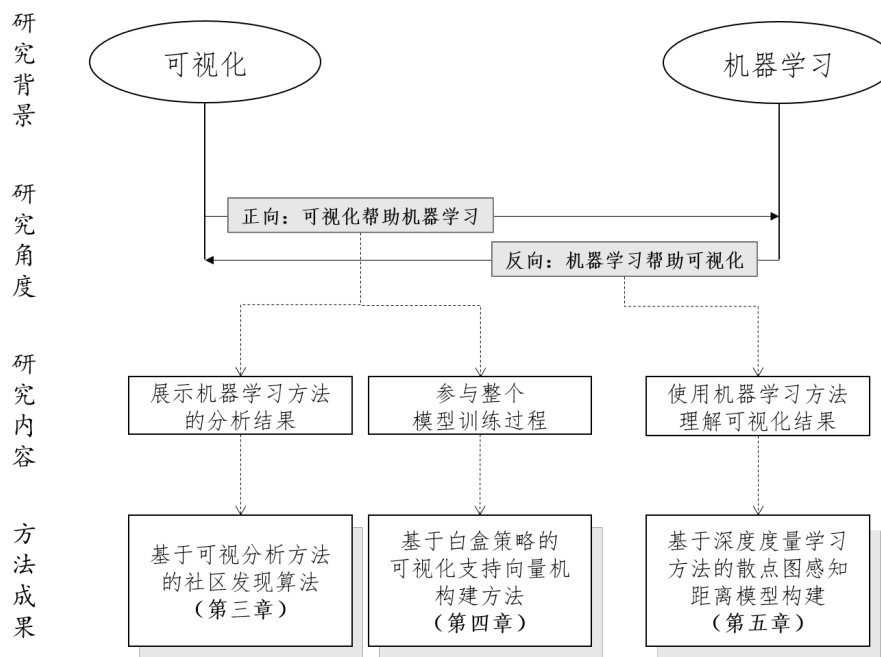


Figure 1: Overview of my PhD thesis.

Deep Learning on Trajectory Data

- Database The data from Ren Yi was imported into MongoDB for further use.
- Model Implementation Kezhi Kong was learning the tutorials of building LSTM with Keras.

New Project: Visualizing Reinforcement Learning Algorithms

As mentioned in the meeting minute on Monday, I should propose another idea for the undergraduate students (Chentao Ye and Chen Liang). Enlightened by Shixia Liu's work [1] (described in Paper Reading) which again applies visualization on another popular machine learning model, it can be a chance to put our focus on reinforcement learning models, a virgin land for visualization and visual analysis.

- Reinforcement learning is now a research trend in machine learning.
- A brief review on Google Scholar and IEEEExplore showed that no existing paper was on this topic.

On Thursday I discussed it with Minfeng about the idea. We agreed that it should be a chance to get some fast papers on that topic. Currently the challenge is to define tasks on “vis”+reinforcement learning.

Paper Reading

Visual Diagnosis of Tree Boosting Methods

A new paper from Shixia Liu’s group and a collaboration with ML experts (Jun Zhu). The paper focuses on the latest improvements of shallow learning models, which is tree boosting methods. The tree boosting methods are widely used in data with low and accurate dimensions, which is not necessary to employ deep learning models. A Common model of tree boosting methods is Gradient Boosting Decision Tree (GBDT). This paper is intended to propose a visual diagnosis method for tree boosting methods, including a novel visual design of temporal confusion matrices.

I believe that the “template” (or “stereotype”) of a series of recent papers from Shixia’s group is quite useful and worth learning.

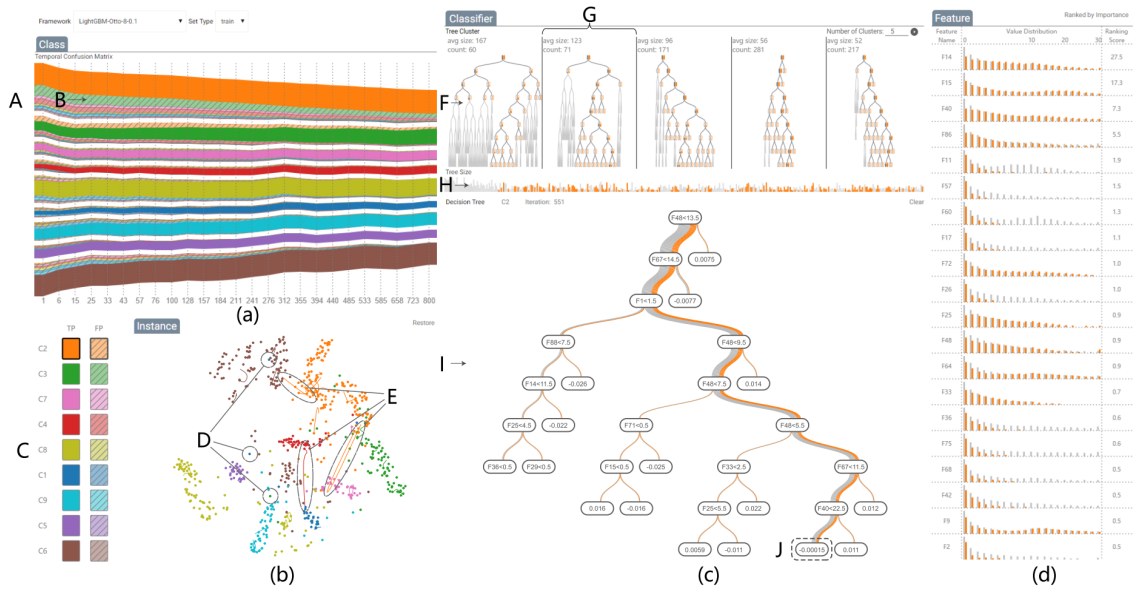


Figure 2: The interface of the BOOSTVis system.

Table 1: Plan for the Next Week

| Target Date | Project | Progress | Problems |
|-----------------|---|---|--|
| 10.20 | PhD Thesis | Writing introduction and related works. | Translation of the existing papers into Chinese as fast as possible. |
| 12.30 | Deep learning and trajectories | | |
| Before VIS 2018 | Visualizing Reinforcement Learning Algorithms | Still planning | Maybe further literature review |

References

- [1] S. Liu, J. Xiao, J. Liu, X. Wang, J. Wu, and J. Zhu, “Visual Diagnosis of Tree Boosting Methods,” IEEE Transactions on Visualization and Computer Graphics, 2017.